CLAIMS

1. A method of correcting resonance position or the external decay time of a waveguide micro-resonator comprising physically altering by deposition, removal, or growth of material in or around said waveguide.

2. The method of claim 1, wherein said altering of the material occurs on the core of the waveguide micro-resonator.

3. The method of claim 1, wherein said altering of the material occurs in the cladding of the waveguide micro-resonator.

4. The method of claim 1, wherein reaction products of a deposition or growth have different chemical compositions from that of the core.

5. The method of claim 1, wherein said altering comprises a wet chemical reaction.

6. The method of claim 1, wherein said altering comprises a thermal reaction at temperatures above 100°C.

7. The method of claim 1, wherein reaction products of a growth are removed after the reaction associated with said growth.

8. The method of claim 1, wherein reaction products of a growth are left between the core and the cladding after the reaction associated with said growth.

9. The method of claim 1, wherein reaction products of a deposition or growth have

refractive indices that range from that of the core to that of the cladding.

10. The method of claim 1, wherein reaction products of a deposition have a graded refractive index profile from that of the core to that of the cladding.

11. The method of claim 1, wherein said altering results in a change in optical path length in said waveguide micro-resonator.

12. The method of claim 1, wherein said altering results in a change in coupling of said waveguide micro-resonator, thus in a change in coupling efficiency and shape of the waveguide micro-resonator resonance.

13. A method of correcting the position of or the shape of resonance of a waveguide micro-resonator comprising focusing a large amount of electromagnetic energy onto the resonator.

14. The method of claim 13, wherein said electromagnetic energy transfers a large amount of thermal energy to the cavity core of said waveguide micro-resonator.

15. The method of claim 13, wherein one or more materials comprising the waveguide micro-resonator undergoes a physical or mechanical change.

16. The method of claim 13, wherein one or more materials comprising the waveguide micro-resonator core undergoes a physical or mechanical change, or an index change.

17. The method of claim 16, wherein one or more materials comprising the waveguide

micro-resonator core undergoes an index change as a result of photosensitivity.

18. The method of claim 16, wherein one or more materials comprising the waveguide micro-resonator core undergoes an index change as a result of a long lasting photo-refractive effect.

19. The method of claim 13, wherein said electromagnetic energy transfers a large amount of thermal energy to a region surrounding the waveguide micro-resonator cavity.

20. The method of claim 13, wherein one or more materials surrounding the waveguide micro-resonator undergoes a physical change from non-chemical origins.

21. The method of claim 13, wherein one or more materials surrounding the waveguide micro-resonator undergoes a mechanical change.

22. The method of claim 13, wherein one or more materials surrounding the waveguide micro-resonator undergoes an index change as a result of photosensitivity.

23. The method of claim 13, wherein one or materials surrounding the waveguide micro-resonator undergoes an index change as a result of a long lasting photo-refractive effect.

24. The method of claim 13, wherein said electromagnetic energy induces a change in optical path length in said waveguide micro-resonator.

25. The method of claim 13, wherein said electromagnetic energy induces a change in coupling of said micro-resonator, thus a change in coupling efficiency and shape of the micro-

resonator resonance.

26. A high index difference waveguide micro-resonator device that temporarily changes position or shape of resonance comprising:

at least one patterned layer core, the at least one patterned layer core has at least one resonator and at least one input/output waveguide;a cladding surrounding said core, said cladding including regions surrounding said core where an evanescent field resides unless temporarily changed; and

non-intersecting input and output waveguides;

at least one layer defining a tuning region; and

at least one electrode in poor electrical contact with said core, wherein

said position or shape of resonance is temporarily changed by applying a current or voltage to said at least one electrode so as to induce a change in index of refraction in said tuning region.

27. The device of claim 26, wherein the tuning region is used to change the index of at least part of the cladding by a thermo-optic effect.

28. The device of claim 26, wherein the tuning region comprises a material whose index is changed through an electro-optic effect.

29. The device of claim 26, wherein the tuning region comprises a material whose index is changed through an acousto-optic effect.

30. The device of claim 26, wherein the tuning region comprises a material whose

index is changed through a magneto-optic effect.

31. The device of claim 26, wherein the tuning region comprises a material whose index is changed through a photo-refractive effect.

32. The device of claim 26, wherein the tuning region comprises a material that is able to move mechanically.

33. The device of claim 26, wherein means for generating a change in the cladding of the micro-resonator are monolithically integrated with said input and output waveguides.

34. The device of claim 26, wherein means for generating a change in the cladding of the micro-resonator are hybridly integrated with said input and output waveguides.

35. The device of claim 26, wherein means for generating a change in the cladding of the micro-resonator are fabricated in the vicinity of said input and output waveguides.

36. The device of claim 26, wherein means for generating a change in the cladding of the micro-resonator are placed in contact with a substrate on which the micro-resonator is configured.

37. The device of claim 26, wherein said at least one electrode stands off at a distance larger than decay length of the optical intensity in the cladding.

38. The device of claim 26, wherein change of said cladding results in a change in optical path length in said micro-resonator.

39. The device of claim 26, wherein change of said cladding results in a change in coupling of said micro-resonator, thus a change in coupling efficiency and shape of the micro-resonator resonance.